

901902 - Aerial Drones for Sci&MO

Week 51

1. Tom O'Reilly
 - a. Attending American Geophysical Union Fall meeting online, including presentations, posters and town halls addressing UAV design, best practices and standards for operations and data processing. I made connections and shared experiences with others in the UAV science community who are applying UAVs to volcano monitoring and Arctic studies.

Week 50

1. Tom O'Reilly
 - a. Attending American Geophysical Union Fall meeting, including presentations, posters and town halls addressing UAV design, best practices and standards for operations and data processing.

Week 49

1. Tom O'Reilly
 - a. Discussing best practices and data standards for processing aerial drone data with members of the Open Geospatial Consortium's [Unoccupied Systems domain working group](#).

Week 48

1. Tom O'Reilly
 - a. Met with Steve Reichardt of the Open Geospatial Consortium and Don Sullivan of NASA's airborne science program regarding UAV standards and best practices (for operations and data processing). There are a few working groups that are focused on defining and developing these now, including the OGC's "UxS" domain working group and the Small UAS data interest group. The latter group in particular is working to establish best data processing practices and metadata standards for UAS imagery

Week 40

1. Tom O'Reilly
 - a. Attended Marine Technology Society workshop on oceanographic UAV applications, with presentations very relevant to MBARI's UAV science goals. Gary Wick described NOAA's work to UAV animal surveys, air-sea chemistry and aerosol studies and weather forecasting applications. Iain Kerr described use of "Snot-Bot" to sample whale exhalations for genetic material, microbiome, and stress hormones. Discussion during the webinar and afterwards with Iain via email provided useful tips on how to accurately measure target sizes in images, which is very relevant to our science objectives. You can view a recording of last week's MTS webinar at this link:
<https://register.gotowebinar.com/recording/97752491093738767>

Week 36

1. Tom O'Reilly
 - a. Held data processing preliminary design review, attended by MBARI engineers and several external collaborators. We received good suggestions on best practices for pre-flight image calibration,

maximizing altimeter accuracy, use of standardized image “metadata” to improve interoperability of our data, and more

Week 34

1. Tom O'Reilly
 - a. Preparing for data processing PDR, scheduled for Thursday 8/20, 14:00 PDT. Working with team and UCSC/CENCOOS collaborators to refine software design and protocols.

Week 33

1. Tom O'Reilly
 - a. Preparing for software PDR on Thursday August 20, including conversations with Kudela lab and CENCOOS to coordinate data distribution and sharing between organizations. Refining data product generation software, from “raw” camera images to geolocated reprojected ‘geotiffs’ more suitable for quantitative analysis and distribution.

Week 31

1. Tom O'Reilly
 - a. Met with Haddock, Ruhl and Bahr to discuss processing software plans for MBARI's UAV program and CENCOS/collaborator programs. Discussing how we can easily exchange data/images between the processing systems.

Week 30

1. Tom O'Reilly
 - a. Completed first prototype of post-flight data processing software, working with Steve Haddock to refine
 - b. Data processing software will be held on Thursday August 20 at 14:00

Week 29

1. Rob McEwen
 - a. Preparing for possible UAV build.

Week 28

1. Tom O'Reilly
 - a. Refining data processing pipeline design, software options, etc. Planning data processing PDR

Week 24

1. Tom O'Reilly
 - a. Preparing for data processing software design review

Week 23

1. Tom O'Reilly
 - a. Preparing for data processing software review, which will describe requirements that flow from science goals, discuss various approaches, and early test results

Week 20

1. Tom O'Reilly
 - a. Planning data processing software review in mid-July - date TBD

Week 19

1. Tom O'Reilly
 - a. Met with team to plan software design review

Week 17

1. Tom O'Reilly
 - a. Described "best practices" for timekeeping in sensors aboard UAV based on review of available techniques and analysis of Hollister test flights. Developing and evaluating tools for post-flight data analysis, evaluating metadata standards to enable efficient image retrieval from archives. Planning for project software review, date TBA.

Week 16

1. Rob McEwen
 - a. Learning how to extract data from tlog format

Week 13

1. Tom O'Reilly
 - a. Refining image and data processing chain, from onboard flight logs and raw images through geolocated and corrected imagery. Using data/photos collected during test flight at Hollister field two weeks ago - very useful and instructive.

Week 12

1. Tom O'Reilly
 - a. Helped team prepare for last week's 'Believer' fixed-wing test flights at Hollister airfield; refining data and image processing chain using imagery acquired during those flights.

Week 11

1. Tom O'Reilly
 - a. Refining image processing and archiving procedures in preparation for Believer fixed-wing UAV test flights later this week

Week 8

1. Tom O'Reilly
 - a. Testing low-cost AIS-B receiver on Raspberry PI. AIS-B is the aerial equivalent of AIS; all crewed aircraft transmit AIS-B messages containing registration number, speed, heading, altitude, location, other parameters. UAVs such as ours will carry AIS-B receivers, along with collision-avoidance software, so that the UAV can autonomously detect and avoid aircraft in their vicinity.
 - b. Planning for next week's test flights of Believer-1 fixed-wing UAV at Hollister airfield. Will exercise mission planning tools, autonomous mission execution and camera triggering, data processing chain, vehicle performance
 - c. Developing MBARI UAV user guide, based on document from University of California. Document will include links to MBARI UAV policy, MBNMS permit, best practices, pre- and post-flight checklists, emergency response, etc.

Week 7

1. Tom O'Reilly

- a. Working to set up ADS-B receiver at MBARI; our UAVs will carry an ADS-B transponder that periodically broadcasts vehicle location, speed, altitude, heading - like an aerial version of AIS. Procured receiver and antenna, preparing Raspberry PI host for the receiver.
- b. Evaluating tools and developing workflow to generate drone mission plans, taking factors such as solar illumination and wind into account.
- c. Helping team to document checklists, “rules of the road” for UAVs at MBARI
- d. Preparing material for UAV software review to be held later in the spring

Week 6

1. Tom O'Reilly
 - a. Planning software design review for onboard, ground, and data processing systems.